

IN THE CLAIMS

Please amend the claims as follows:

Claim 1 (Currently amended): A method for measuring elastic characteristics of a medium, comprising ~~the steps of~~:

applying vibrations to the medium;

acquiring an N number of ultrasound image frames of the medium;

estimating a variation in brightness of a speckle pattern over the N number of ultrasound image frames by calculating an average brightness and variance in brightness for every pixel over the N number of ultrasound image frames, wherein the average brightness and variance in brightness are calculated by the following equations:

$$m_N(i, j) = m_{N-1}(i, j) + \frac{1}{N}[x_N(i, j) - m_{N-1}(i, j)]$$

$$\sigma_N^2(i, j) = \sigma_{N-1}^2(i, j) + m_{N-1}^2(i, j) + \frac{1}{N}[x_N^2(i, j) - Nm_N^2(i, j) - \sigma_{N-1}^2(i, j) - m_{N-1}^2(i, j)]$$

wherein N is a current frame number, N-1 is a previous frame number, $X_N(i, j)$ represents a brightness value of the $(i, j)^{\text{th}}$ pixel in the n^{th} frame, $m_N(i, j)$ and $m_{N-1}(i, j)$ represent an average brightness for the $(i, j)^{\text{th}}$ pixel over the N number of frames as counted from the first frame and an average brightness for the $(i, j)^{\text{th}}$ pixel over the N-1 number of frames as counted from the first frame, respectively, and $\sigma_N^2(i, j)$ and $\sigma_{N-1}^2(i, j)$ represent a variance in brightness for the $(i, j)^{\text{th}}$ pixel over the N number of frames as counted from the first frame and a variance in brightness for the $(i, j)^{\text{th}}$ pixel over the N-1 number of frames as counted from the first frame, respectively; and

measuring the elastic characteristics of the medium based on the estimated brightness variation.

Claim 2 (Canceled).

Claim 3 (Currently amended): The method according to claim 2 1, wherein a first frame delay element is used for storing the average brightness taken up to the (N-1)th frame, $m_{N-1}(i, j)$, and a second frame delay element is used for storing the variance in brightness taken up to the (N-1)th frame, $\sigma_{N-1}^2(i, j)$.

Claim 4 (Currently amended): The method according to claim 1, wherein the ~~step of~~ estimating includes finding maximum and minimum values of brightness for each pixel over the N number of ultrasound image frames and calculating an absolute difference value between the maximum and minimum values.

Claim 5 (Currently amended): The method according to claim 2 1, wherein the average brightness and the variance in brightness are calculated by recursion.

Claim 6 (Currently amended): An apparatus for measuring elastic characteristics of a medium, comprising:

a vibrator for applying vibrations to the medium;

transducers for acquiring an N number of ultrasound image frames of the medium;

means for estimating a variation in brightness of a speckle pattern over the N number of ultrasound image frames, wherein the means for estimating calculates an average brightness and variance in brightness for every pixel over the N number of ultrasound image frames by using the following equations:

$$m_N(i, j) = m_{N-1}(i, j) + \frac{1}{N} [x_N(i, j) - m_{N-1}(i, j)]$$

$$\sigma_N^2(i, j) = \sigma_{N-1}^2(i, j) + m_{N-1}^2(i, j) + \frac{1}{N} [x_N^2(i, j) - Nm_N^2(i, j) - \sigma_{N-1}^2(i, j) - m_{N-1}^2(i, j)]$$

wherein N is a current frame number, N-1 is a previous frame number, $X_N(i, j)$ represents a brightness value of the $(i, j)^{\text{th}}$ pixel in the n^{th} frame, $m_N(i, j)$ and $m_{N-1}(i, j)$ represent an average brightness for the $(i, j)^{\text{th}}$ pixel over the N number of frames as counted from the first frame and an average brightness for the $(i, j)^{\text{th}}$ pixel over the N-1 number of frames as counted from the first frame, respectively, and $\sigma_N^2(i, j)$ and $\sigma_{N-1}^2(i, j)$ represent a variance in brightness for the $(i, j)^{\text{th}}$ pixel over the N number of frames as counted from the first frame and a variance in brightness for the $(i, j)^{\text{th}}$ pixel over the N-1 number of frames as counted from the first frame, respectively; and

means for measuring the elastic characteristics of the medium based on the estimated brightness variation.

Claim 7 (Canceled).

Claim 8 (Currently amended): The apparatus according to claim 7 ~~6~~, wherein the means for estimating further comprises first and second frame delay elements, the first frame delay element storing the average brightness taken up to the $(N-1)^{\text{th}}$ frame, $m_{N-1}(i, j)$, and the second frame delay element storing the variance in brightness taken up to the $(N-1)^{\text{th}}$ frame, $\sigma_{N-1}^2(i, j)$.

Claim 9 (Original): The apparatus according to claim 6, wherein the means for estimating finds maximum and minimum values of brightness for each pixel over the N number of ultrasound image frames and calculates an absolute difference value between the maximum and minimum values.

Claim 10 (Currently amended): The apparatus according to claim 7 6, wherein the means for estimating calculates the average brightness and the variance in brightness by recursion.